

COUNTY OF SAN DIEGO EMERGENCY MEDICAL SERVICES



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SAN DIEGO COUNTY TRAUMA SYSTEM REPORT

2018



COUNTY OF SAN DIEGO EMERGENCY MEDICAL SERVICES

2018 TRAUMA SYSTEM REPORT

San Diego County Facts

Population - 3,337,456

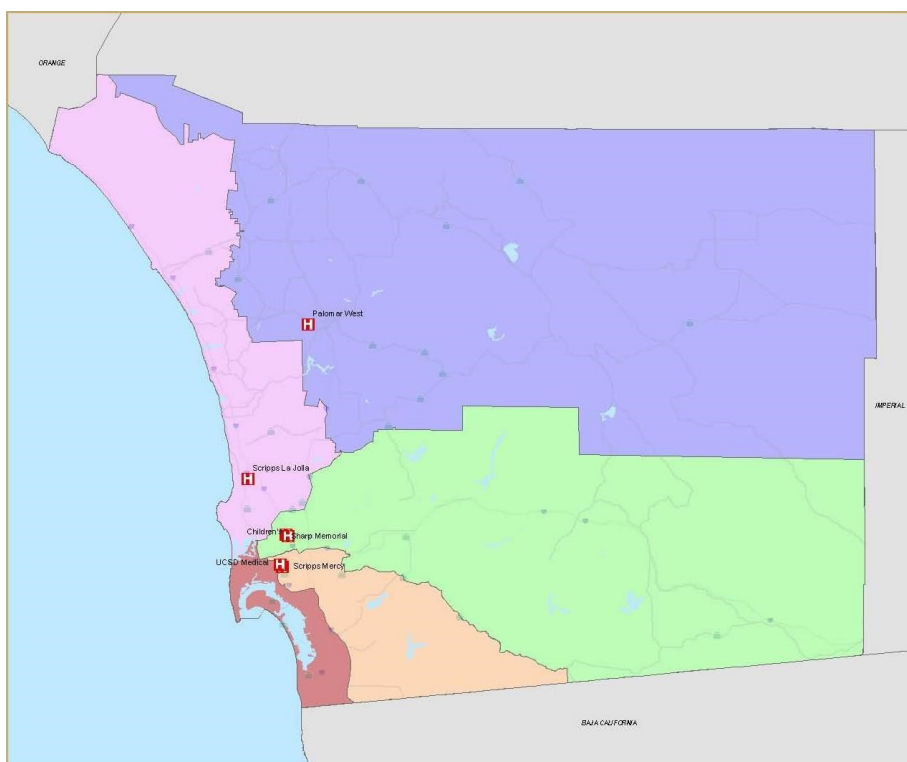
Square Miles - Over 4,200

Adult Trauma Centers

- Scripps Mercy Hospital
- Palomar Medical Center
- Scripps Memorial Hospital
- Sharp Memorial Hospital
- UCSD Medical Center

Pediatric Trauma Center

- Rady Children's Hospital



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San Diego County Trauma System Report, 2018

Introduction and *Live Well San Diego*

Introduction

In October 1983, with support and direction from the San Diego County Board of Supervisors, the Department of Health Services created an Ad Hoc Trauma Advisory Task Force to assist in the review and evaluation of the Hospital Council – Medical Society Trauma Plan. The advisory group of outside trauma experts conducted public hearings and informal sessions with hospital and prehospital trauma providers, and synthesized the experiences of other trauma systems into a single set of recommendations for the Department and the Board of Supervisors to consider. The recommendations urged the County to adopt trauma standards that closely approximated the American College of Surgeons' guidelines. The community consensus that emerged from their effort resulted in the formal adoption of their recommendations by the County Board of Supervisors in November 1983.

Once the trauma standards were adopted, the Department implemented a competitive selection process, seeking to designate five adult trauma centers and one pediatric trauma center. Designation criteria were incorporated in a Request for Proposal and the Ad Hoc Trauma Advisory Task Force became the Proposal Review Committee to evaluate and recommend hospitals for designation. Six facilities were awarded provisional designation status based on the quality of trauma services provided.

On August 1, 1984, after 16 months of direct preparation, major trauma victims in San Diego County began bypassing community hospitals in favor of designated trauma centers.

The purpose of this annual report is to describe the San Diego County Trauma System with regards to various aspects of data, including patient volume, patient demographics, mechanisms of injury, and patient outcomes.

***Live Well San Diego* and Trauma**

Live Well San Diego is a regional vision adopted by the San Diego County Board of Supervisors in 2010 that aligns the efforts of County government, community partners and individuals to help all San Diego County residents be healthy, safe, and thriving. The vision includes three components. *Building Better Health*, adopted on July 13, 2010, focuses on improving the health of residents and supporting healthy choices; *Living Safely*, adopted on October 9, 2012, focuses on protecting residents from crime and abuse, making neighborhoods safe, and supporting resilient communities; and, *Thriving*, adopted on October 21, 2014, focuses on cultivating opportunities for all people to grow, connect and enjoy the highest quality of life.

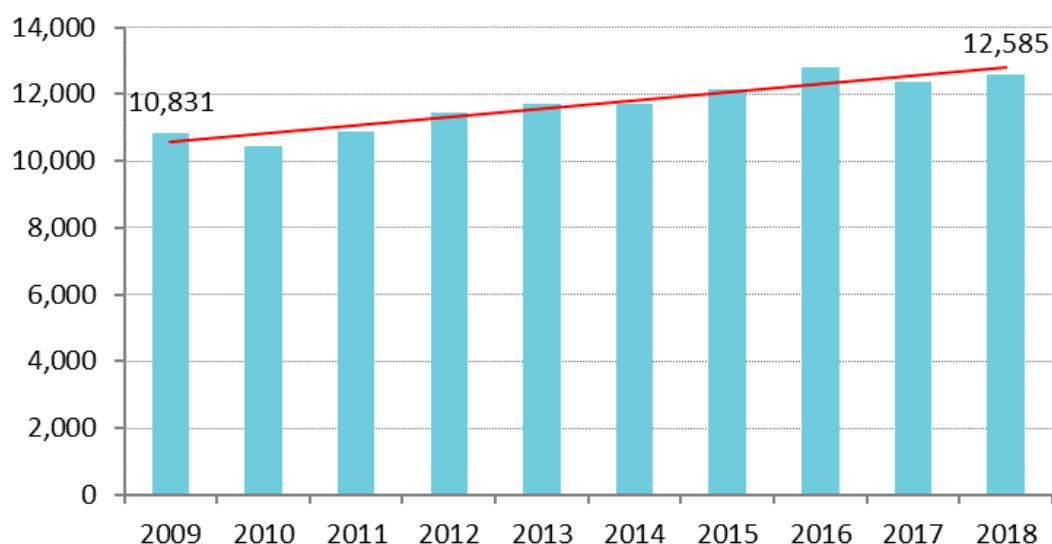
Healthcare and services organizations are working together to improve access and quality of care for local residents. Healthcare providers are implementing innovative strategies to reduce hospital readmissions for our most vulnerable populations and integrating behavioral health services into primary care to improve patient outcomes and reduce the stigma of mental illness. They are also adopting workplace wellness practices to achieve a healthy bottom line for our region. Services organizations are working with the County to implement nutrition education programs for low income families and to help families navigate through complex systems to gain access to needed services.

This San Diego County Trauma System Report contributes to the *Live Well San Diego* vision by reporting the incidence of traumatic injuries with the goal of injury and violence prevention in support of a healthy, safe and thriving region.

San Diego County Trauma System Report, 2018

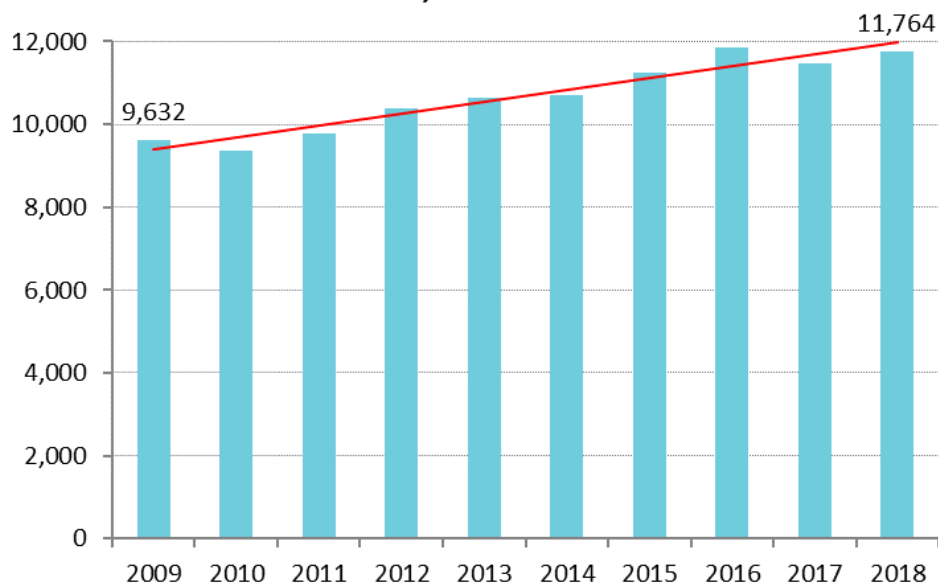
Trauma System Overview Patient Volume

A Decade of Trauma



Over the last decade the San Diego County Trauma System has witnessed a 16.2% increase in total trauma volume and an 22.1% increase in trauma volume at the adult trauma centers. Over that same time period, the County of San Diego has experienced a 8.9% increase in population.

Trauma Volume, Adult Trauma Centers



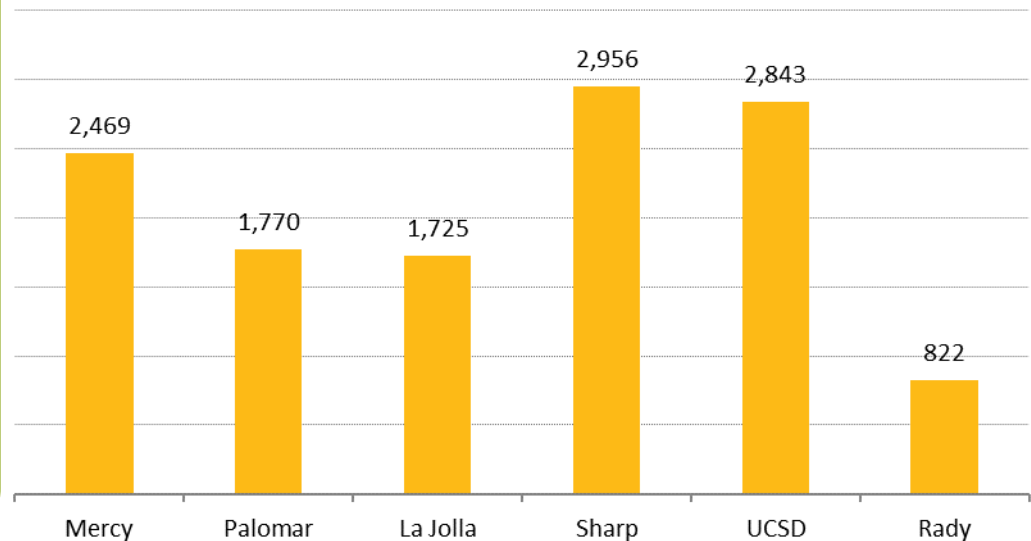
Source of all data: County of San Diego, Health and Human Services Agency, Emergency Medical Services, Trauma Registry, 2018.

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Trauma System Overview Patient Volume

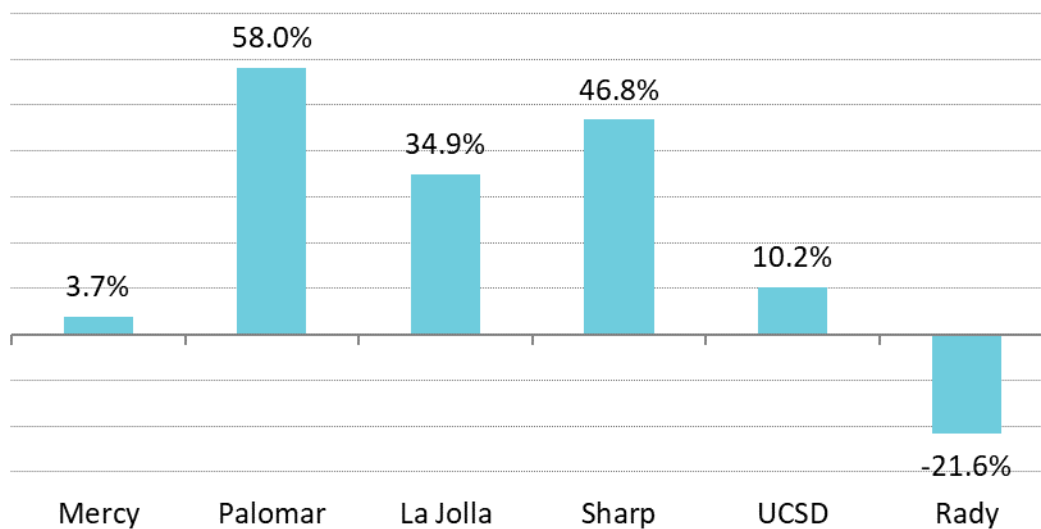
Total Trauma Volume by Trauma Center, 2018

In 2018, there were 12,585 total patients treated in the San Diego County Trauma System, with Sharp Memorial experiencing the most annual volume growth compared to 2017.



All adult trauma centers experienced a seven-year increase in total volume, with Palomar having the largest increase. However, Rady Children's experienced a 21.6% decrease in trauma volume over the last seven years.

Eight Year Change in Trauma Volume, 2010-2018



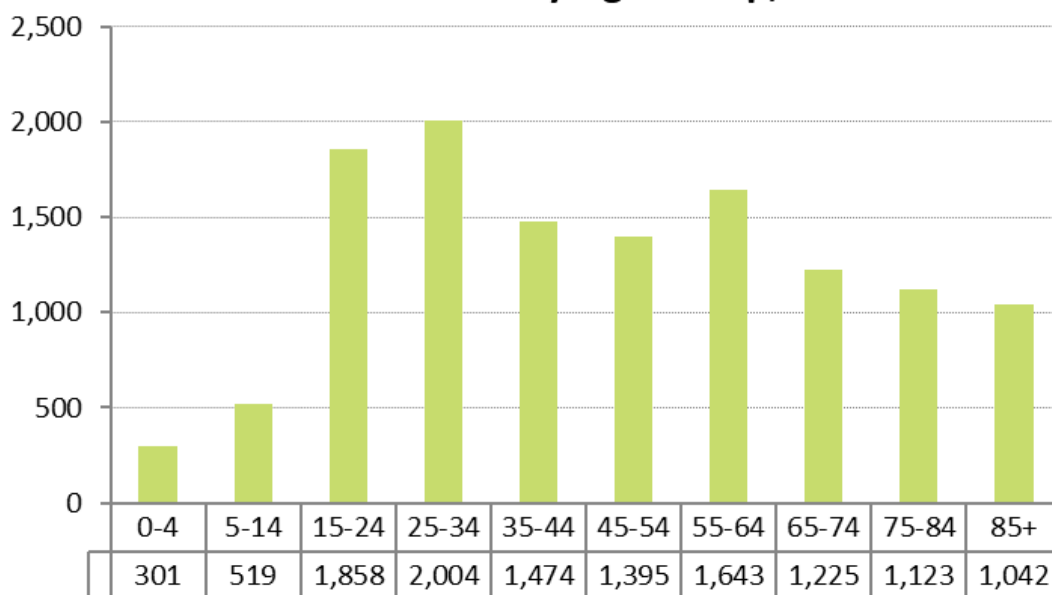
Source of all data: County of San Diego, Health and Human Services Agency, Emergency Medical Services, Trauma Registry, 2018.

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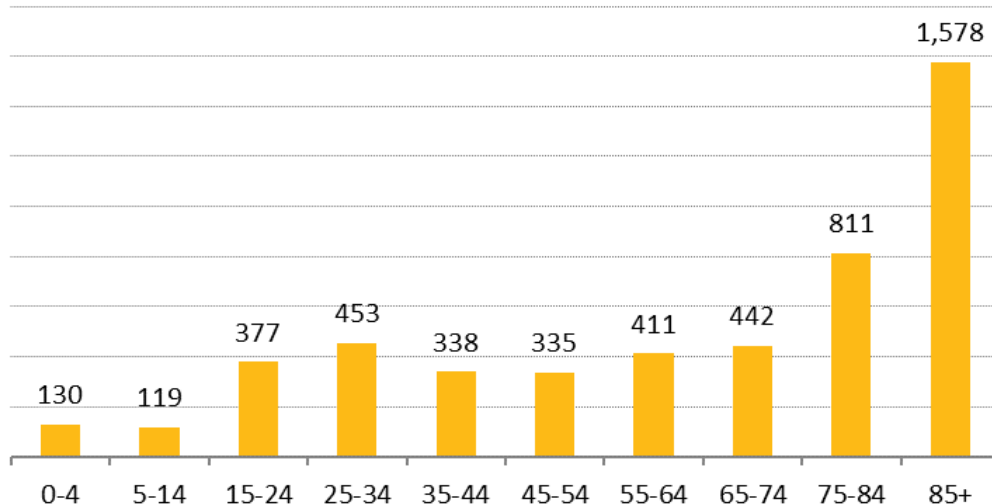
Trauma System Overview Patient Volume—Age Groups

Trauma Patients by Age Group, 2018

In 2018,
67% of
trauma
patients
were aged
15 to 64
years.



Trauma Patient Rate* by Age Group



*Rate per 100,000 people.

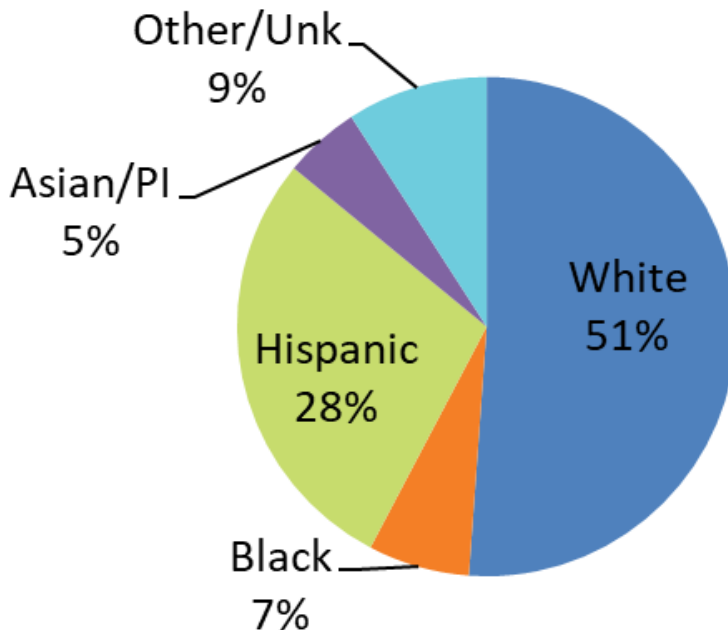
Although the majority of injuries occur in younger age groups, those 85 years and older are at a much higher risk of traumatic injury compared to other age groups.

Source of all data: County of San Diego, Health and Human Services Agency, Emergency Medical Services, Trauma Registry, 2018.

San Diego County Trauma System Report, 2018

Trauma System Overview Patient Volume—Race/Ethnicity

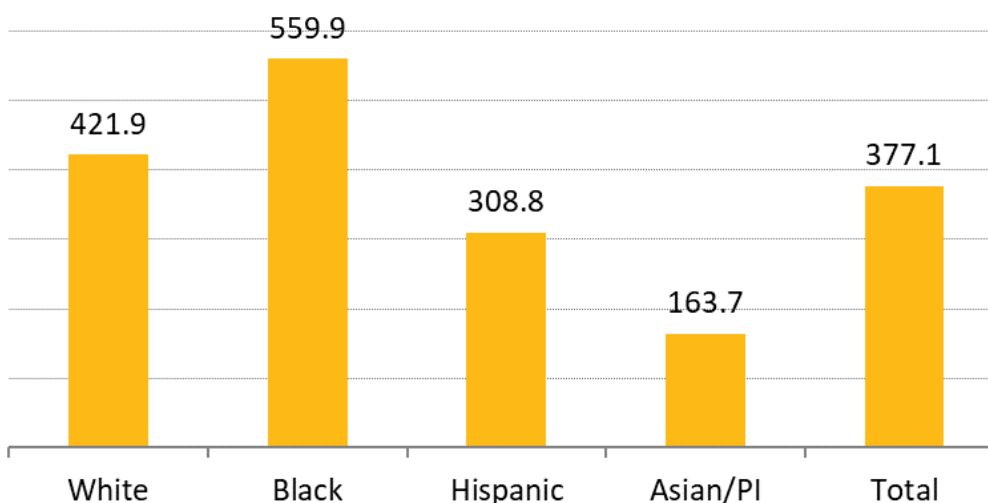
Trauma Patients by Race/Ethnicity Percent



In 2018, 51% of trauma patients were white, with Hispanics (28%) making up the next largest race/ethnicity.

In 2018, Asians/Pacific Islanders had the lowest rate of traumatic injury at about 164 injuries per 100,000 people.

Trauma Patients by Race/Ethnicity Rate*



*Rate per 100,000 people.

Blacks are at higher risk of traumatic injury compared to other race/ethnicities, with about 560 injuries occurring for every 100,000 people.

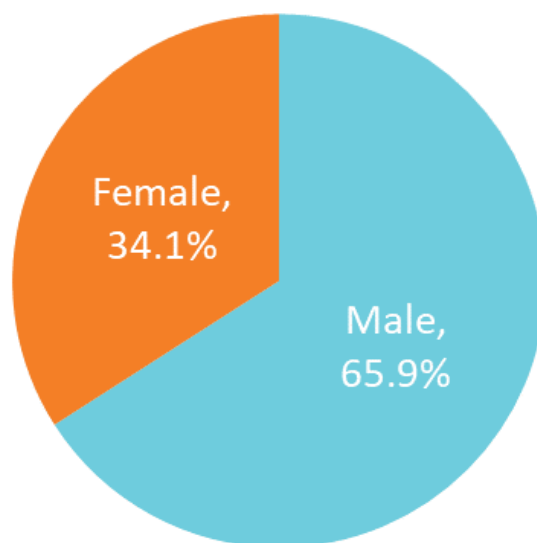
Source of all data: County of San Diego, Health and Human Services Agency, Emergency Medical Services, Trauma Registry, 2018.

San Diego County Trauma System Report, 2018

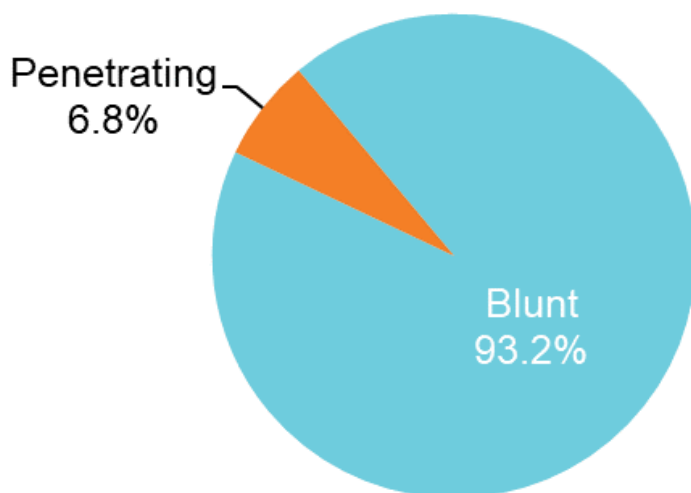
Trauma System Overview Patient Volume—Gender and Injury Type

Percent of Trauma Patients by Gender, 2018

In 2018, male trauma patients outnumbered females by about two to one. This has been a consistent trend for many years.



Percent of Trauma Patients by Injury Type



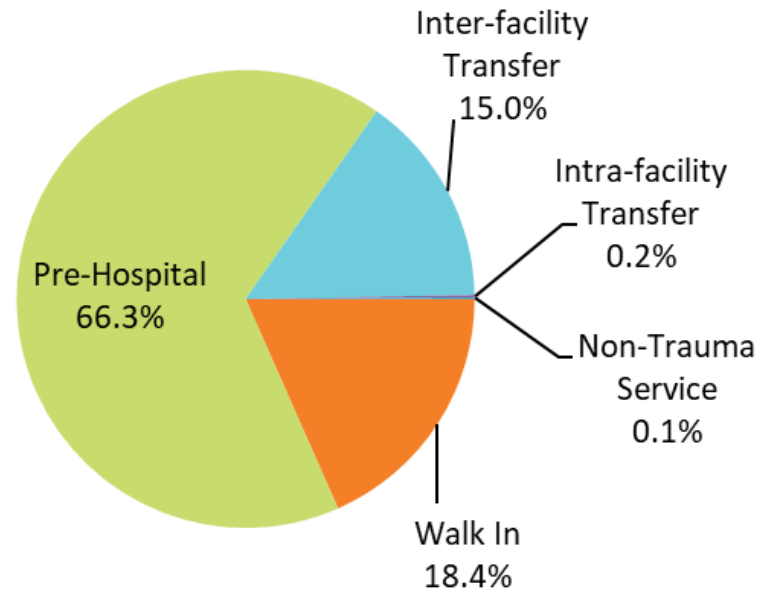
Similar to previous years, patients with blunt injuries outnumbered those with penetrating injuries by more than ten to one.

San Diego County Trauma System Report, 2018

Trauma System Overview Patient Volume—System Access

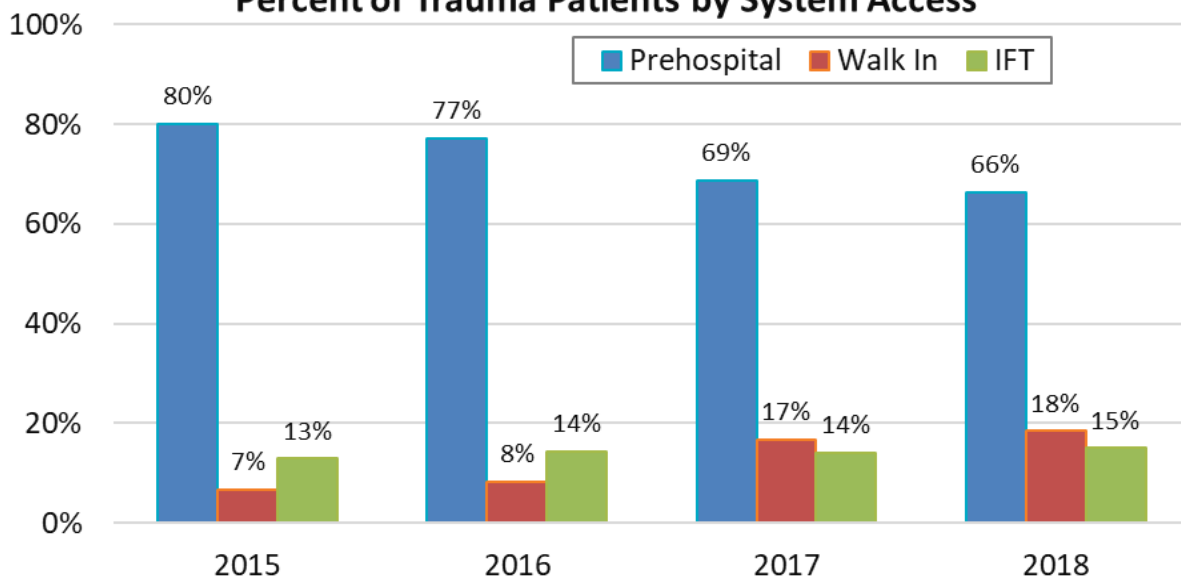
Trauma Patients by Method of System Access

In 2018, there were 8,345 patients delivered directly to trauma centers by pre-hospital, 2,314 walk-ins, and 1,891 inter-facility transfers. This distribution of trauma patients is shifting away from prehospital with walk-ins increasing.



Since 2015, the proportion of trauma patients arriving by ambulance has decreased by 17% while the proportion walking into the emergency department has increased by 175%. Interfacility transfers have also increased over this time.

Percent of Trauma Patients by System Access



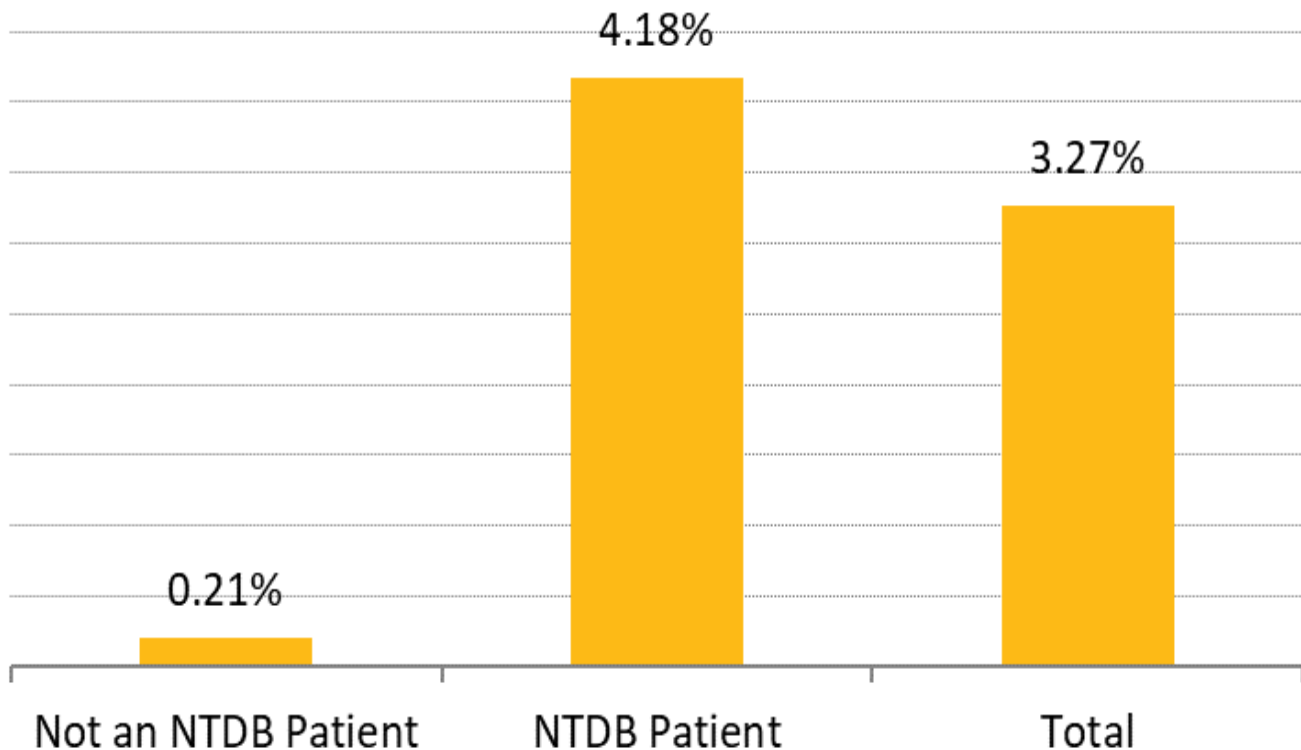
Source of all data: County of San Diego, Health and Human Services Agency, Emergency Medical Services, Trauma Registry, 2018.

San Diego County Trauma System Report, 2018

Trauma System Overview Mortality Rates

In 2018, the overall mortality rate of the San Diego County Trauma System was 3.27%. For those patients who qualified for the National Trauma Data Bank, the mortality rate was 4.18%.

2018 Trauma Patient Mortality Rates



NTDB: National Trauma Data Bank. Some patients treated at San Diego County Trauma Centers do not meet criteria for NTDB inclusion.

Note: Mortality rates are calculated using traumatic deaths that were treated at trauma centers. For a more complete report on traumatic deaths in San Diego County, including those dead on scene, please refer to the San Diego County Medical Examiner Annual Report available at: www.sandiegocounty.gov/me/.

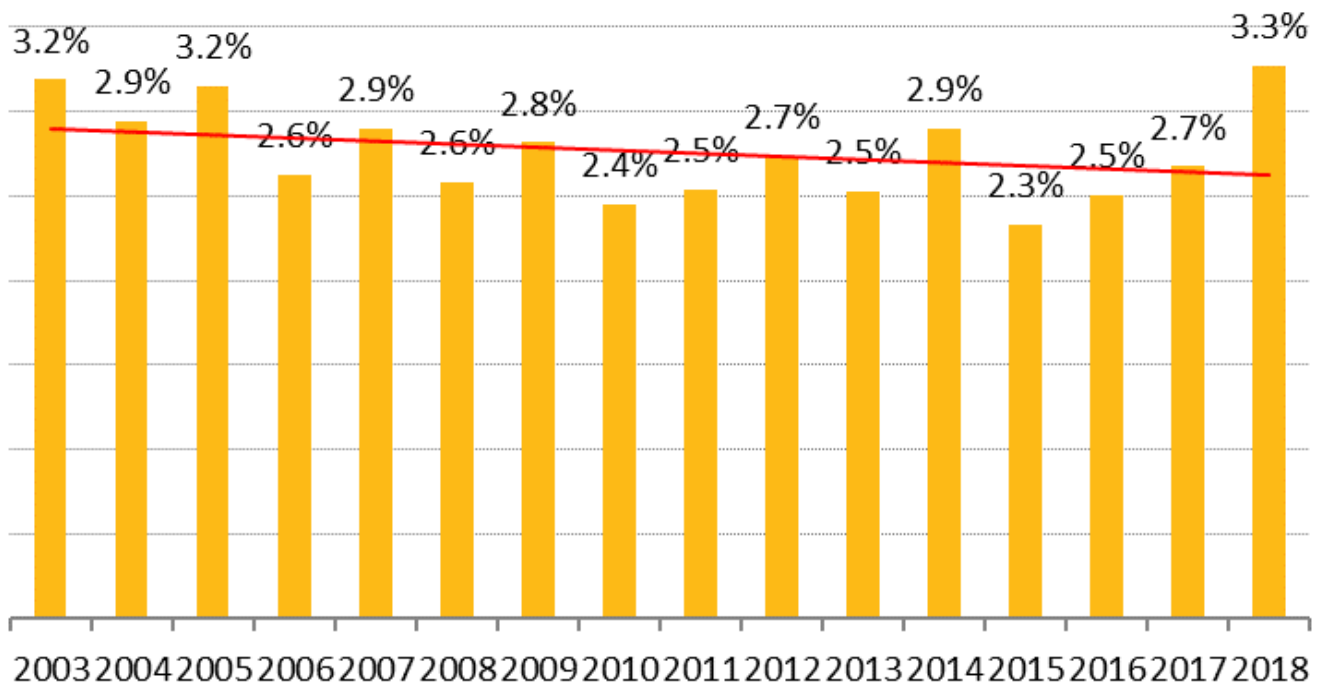
Source of all data: County of San Diego, Health and Human Services Agency, Emergency Medical Services, Trauma Registry, 2018.

San Diego County Trauma System Report, 2018

Trauma System Overview Mortality Rate Trends

Mortality rate trends have generally decreased as the San Diego County Trauma System has matured. However, the 2018 mortality rate was higher than the three previous years. The recent increase in mortality rates is likely explained by the increase in older patients with fall-related injuries as age is an extreme risk factor for mortality.

Mortality Rates, 2003 - 2018

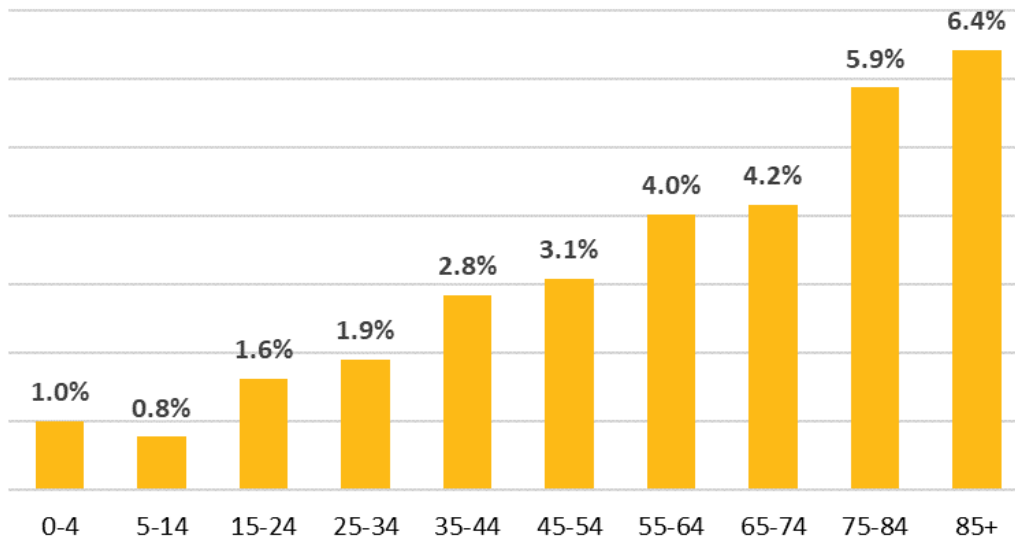


Source of all data: County of San Diego, Health and Human Services Agency, Emergency Medical Services, Trauma Registry, 2018.

San Diego County Trauma System Report, 2018

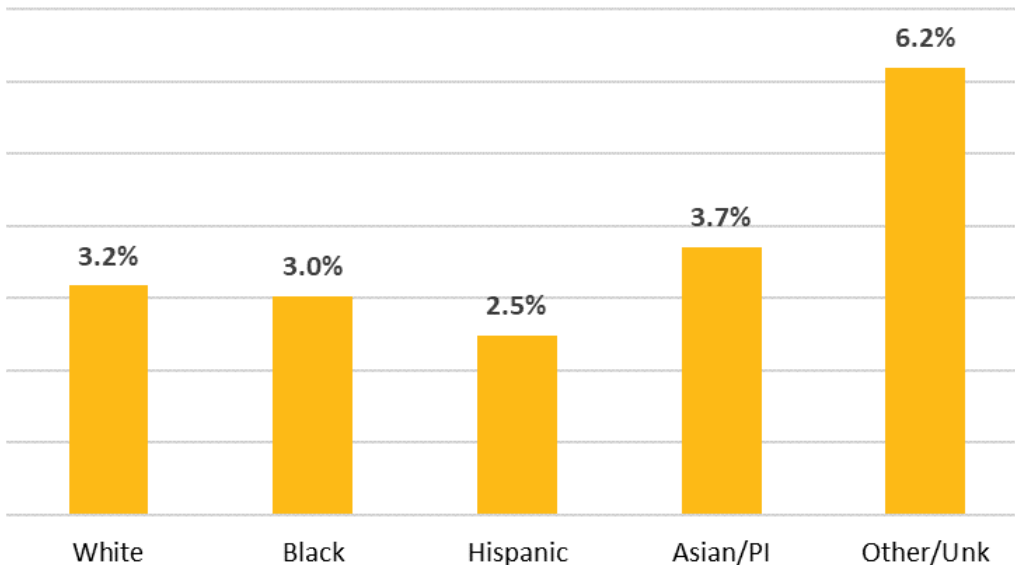
Mortality Rates and Demographics

Mortality Rate by Age Group, 2018



Age is an important factor associated with survival in almost all causes of death. This is demonstrated fully in trauma as we see increased mortality rates as patient age increases.

Mortality Rate by Race/Ethnicity



While Asian/Pacific Islanders had the lowest incidence of traumatic injury in 2018, they actually had the highest mortality rate among patients with a known race/ethnicity. Hispanics had the lowest mortality rate.

San Diego County Trauma System Report, 2018

Mechanism of Injury—Age Groups

Top Five Trauma Mechanisms by Age Group					
Age	1	2	3	4	5
0 - 4	Falls	MV Traffic	Assault	Pedestrian	Other Trans
	179	51	24	15	2
5 - 14	Falls	MV Traffic	Pedestrian	Other Trans	Pedalcycle
	150	98	73	46	41
15 - 24	MV Traffic	Assault	Motorcycle	Falls	Pedestrian
	584	296	250	191	147
25 - 34	MV Traffic	Assault	Motorcycle	Falls	Pedestrian
	511	391	337	266	121
35 - 44	MV Traffic	Assault	Falls	Motorcycle	Pedestrian
	351	289	250	180	106
45 - 54	Falls	MV Traffic	Assault	Motorcycle	Pedalcycle
	334	245	185	155	130
55 - 64	Falls	MV Traffic	Assault	Pedalcycle	Pedestrian
	652	271	145	132	123
65 - 74	Falls	MV Traffic	Pedestrian	Pedalcycle	Motorcycle
	726	200	74	61	38
75 - 84	Falls	MV Traffic	Pedestrian	Other Trans	Assault
	859	141	34	19	13
85+	Falls	MV Traffic	Pedestrian	Assault	Other Trans
	921	64	23	3	3
Total	Falls	MV Traffic	Assault	Motorcycle	Pedestrian
	4528	2516	1396	1114	839

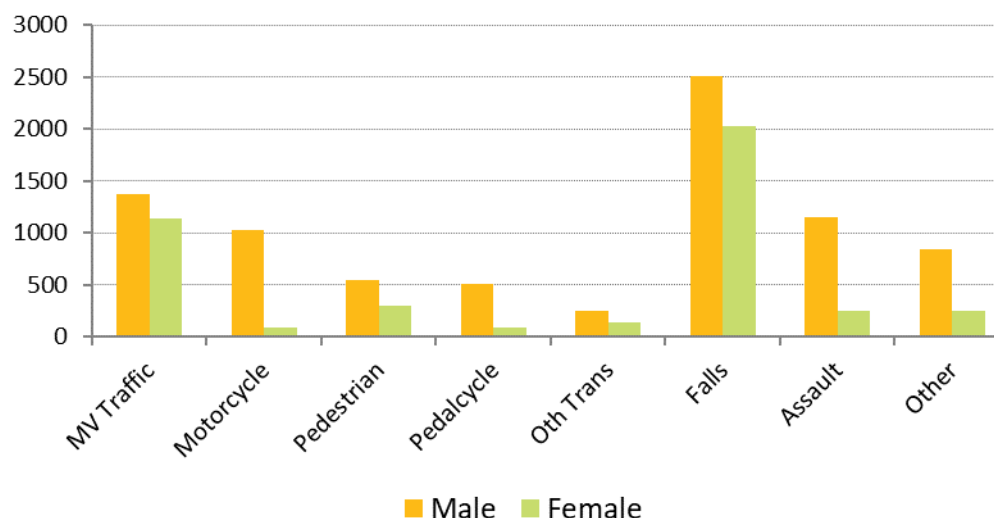
In 2018, falls accounted for 36% of all causes of injury in the San Diego County Trauma System. Additionally, falls are the number one cause of injury in each age group, other than those aged 15 to 44 years.

Source of all data: County of San Diego, Health and Human Services Agency, Emergency Medical Services, Trauma Registry, 2018.

San Diego County Trauma System Report, 2018

Mechanism of Injury—Gender and Race/Ethnicity

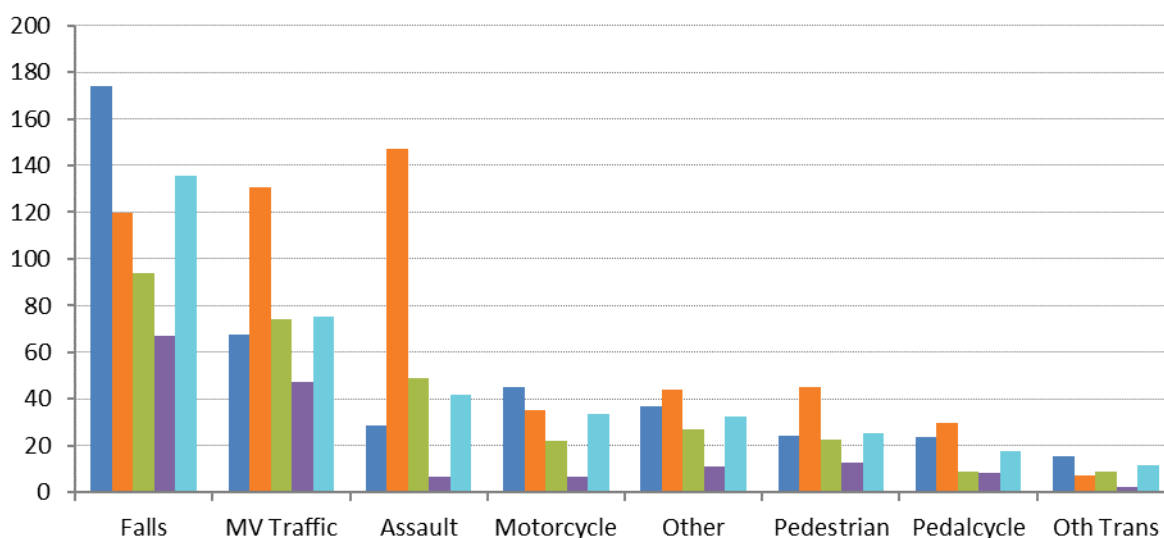
Mechanism of Injury by Gender, 2018



Other than motor vehicle traffic injuries, males substantially exceeded females in all other causes of injury. The largest differences occurred in motorcycle, pedalcycle, and assault injuries.

While whites had the highest risk of fall-related injuries and motorcycle injuries, blacks had the highest rate for motor vehicle injuries, assault injuries, pedalcycle injuries, and pedestrian injuries. Asians and Pacific Islanders had a very low rate of fall-related injuries and other mechanisms in general.

Mechanism of Injury Rate* by Race/Ethnicity, 2018



*Rate per 100,000 people. ■ White ■ Black ■ Hispanic ■ Asian/PI ■ Total

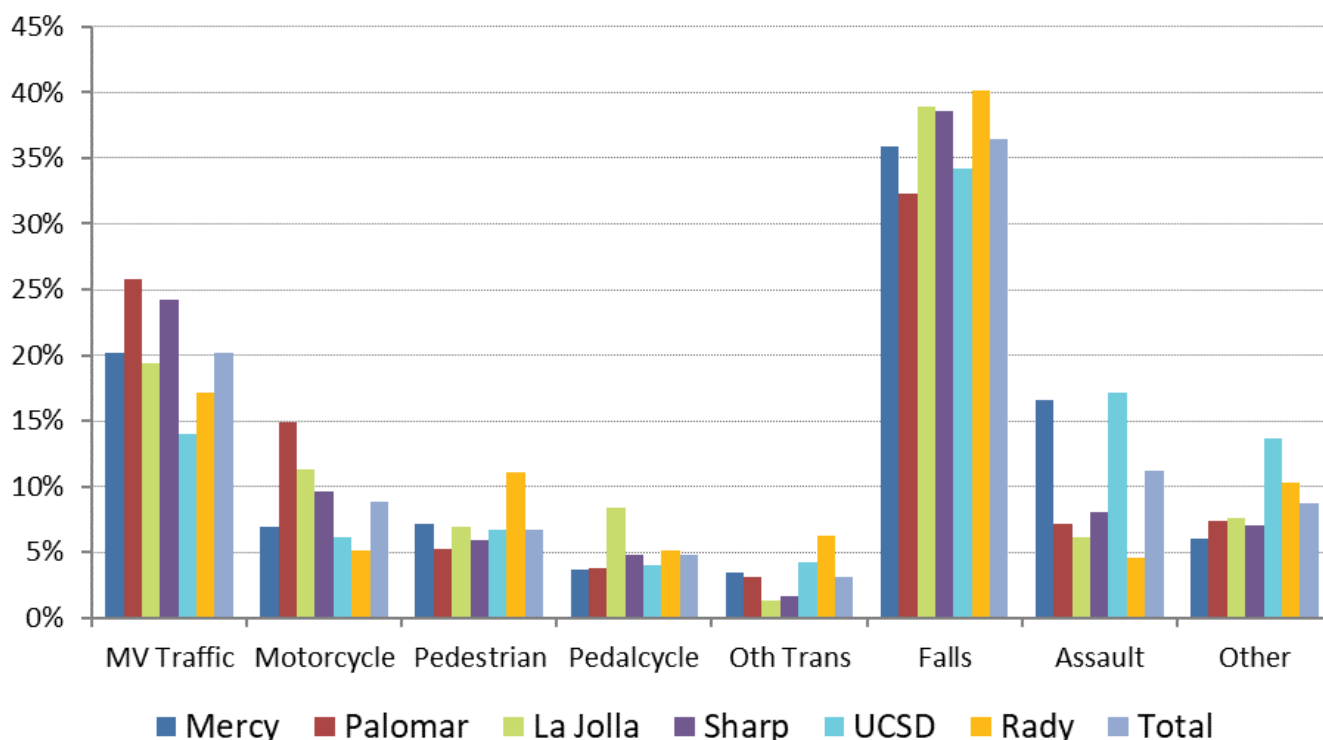
Source of all data: County of San Diego, Health and Human Services Agency, Emergency Medical Services, Trauma Registry, 2018.

San Diego County Trauma System Report, 2018

Mechanism of Injury—Trauma Centers

In 2018, 26% of Palomar Medical Center's traumatic injuries were from motor vehicle injuries and 15% were from motorcycle injuries, which were higher than other trauma centers. At 11%, Rady Children's experienced a higher percent of pedestrian injuries than other centers, and Scripps La Jolla had the highest percent of pedalcycle injuries. UCSD and Scripps Mercy had the highest percent of assault injuries. For each trauma center, fall-related injuries represented the highest percent of patients.

Percent of Injuries by Trauma Center and Mechanism, 2018

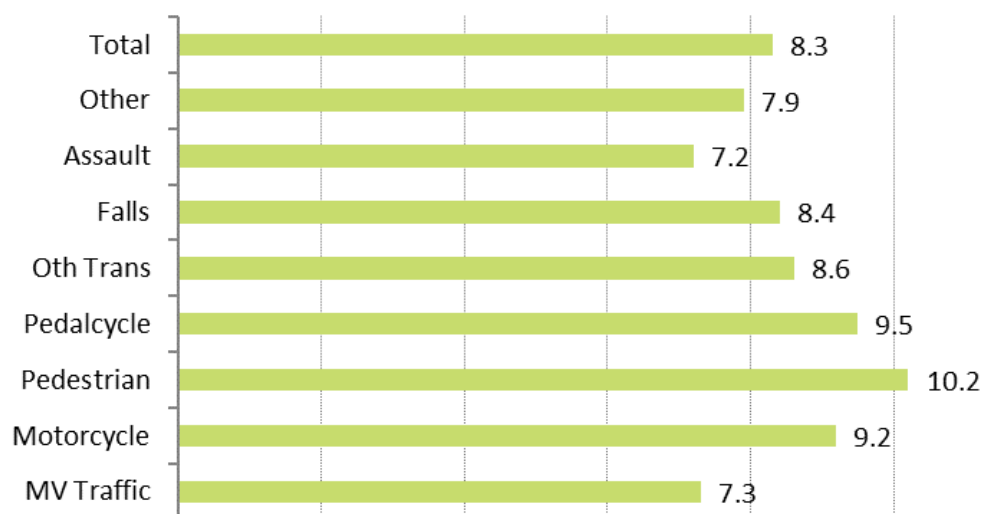


Source of all data: County of San Diego, Health and Human Services Agency, Emergency Medical Services, Trauma Registry, 2018.

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Mechanism of Injury—Injury Severity and Length of Stay

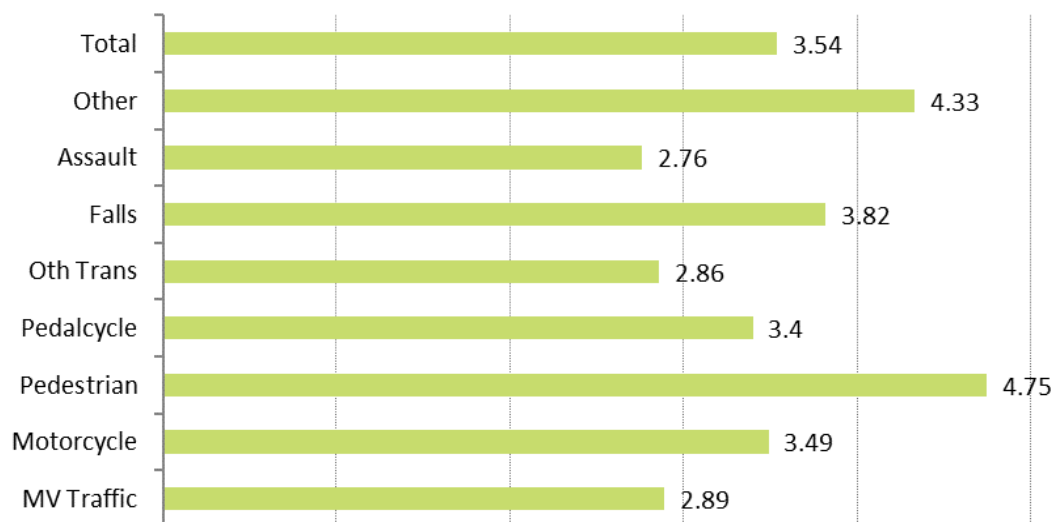
Mechanism of Injury by Mean ISS*



Pedestrian injuries were the most severe, while motor vehicle traffic and assault injuries were among the least severe mechanisms of injury. The total average injury severity score was 8.3.

*ISS: Injury Severity Score.

Mechanism of Injury by Mean Length of Stay in Days



Being the most severe, pedestrian injuries also led to the longest lengths of stay. The shortest lengths of stay were from motor vehicle traffic and assault injuries. The overall mean length of stay was 3.54 days.

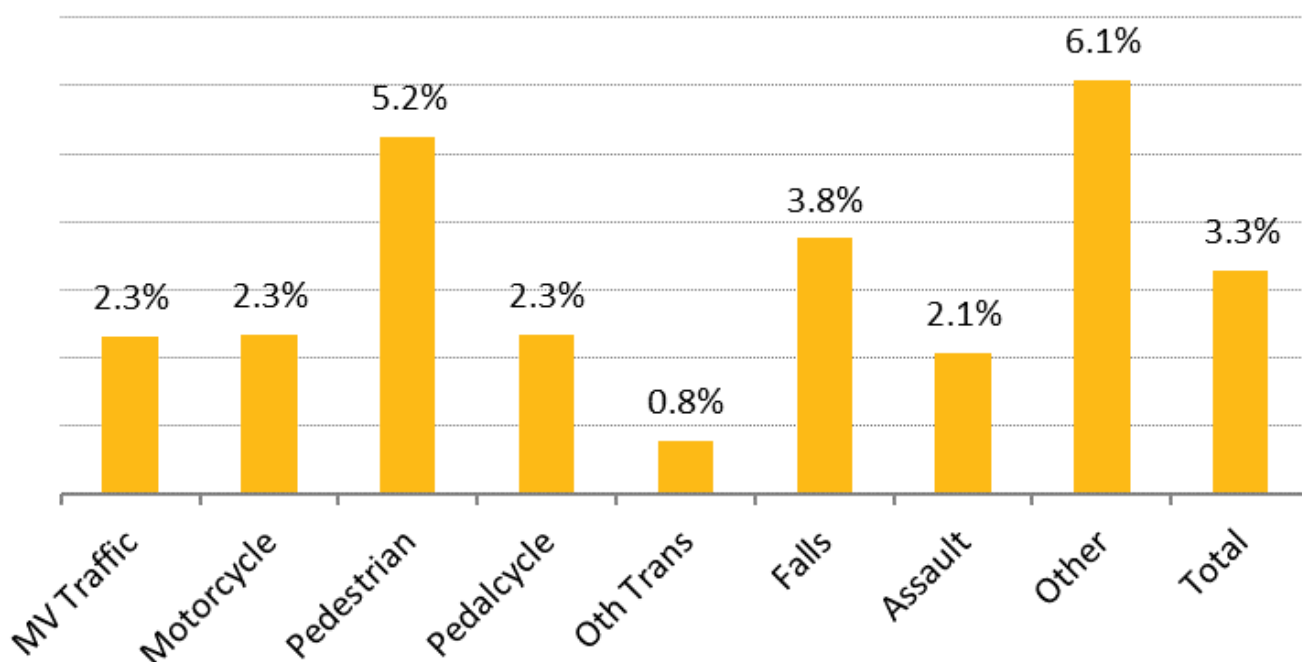
Source of all data: County of San Diego, Health and Human Services Agency, Emergency Medical Services, Trauma Registry, 2018.

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Mechanism of Injury—Mortality Rates

In 2018, mortality rates differed greatly by mechanism of injury. About 5.2% of pedestrian injury patients who made it to a trauma center did not survive their injuries. Conversely, only one in 48 assault injury patients died. About one in 26 fall-related injury patients died. This is an important number to track as fall-related injuries continue to increase in San Diego County. The fall-related mortality rate was 2.7% in 2016 and 3.4% in 2017.

Mortality Rate by Mechanism of Injury, 2018

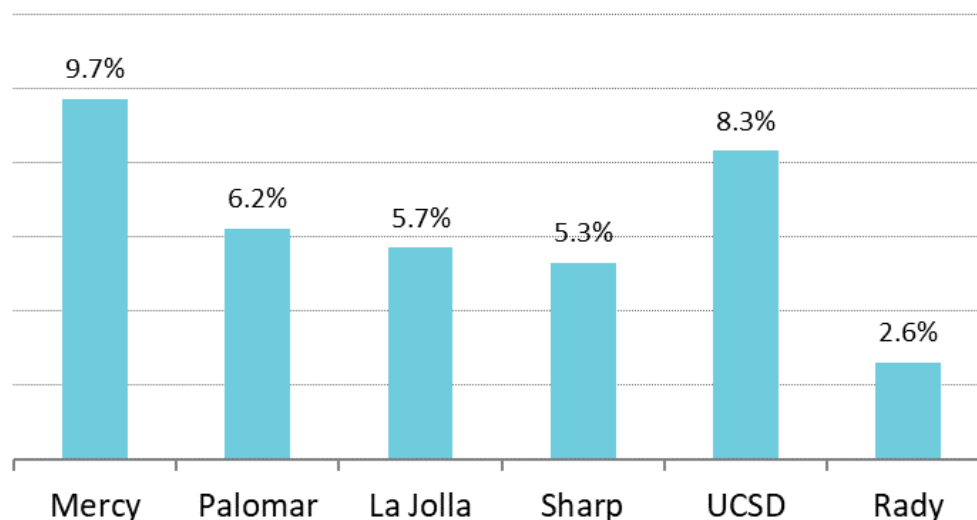


Note: Mortality rates are calculated using traumatic deaths that were treated at trauma centers. For a more complete report on traumatic deaths in San Diego County, including those dead on scene, please refer to the San Diego County Medical Examiner Annual Report available at: www.sandiegocounty.gov/me/.

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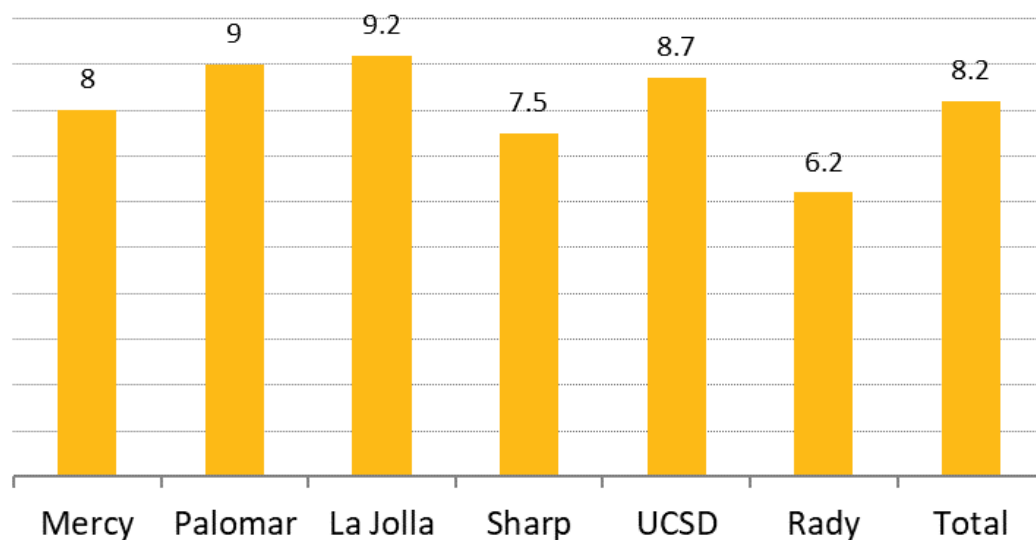
Injury Type and ISS by Trauma Center

Percent Penetrating by Trauma Center, 2018



Mercy and UCSD had the highest percent of penetrating injuries. Of the adult centers, Sharp had the lowest percent of penetrating injuries, while Rady Children's had the lowest overall.

Mean ISS* by Trauma Center, 2018



Among the adult trauma centers, La Jolla had the highest mean ISS with Sharp having the lowest. Rady Children's had the lowest overall mean ISS.

*ISS: Injury Severity Score.

Source of all data: County of San Diego, Health and Human Services Agency, Emergency Medical Services, Trauma Registry, 2018.

Directory

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RADY CHILDREN'S HOSPITAL SAN DIEGO
3020 Childrens Way, San Diego, CA 92123 - (858) 576-1700

SCRIPPS MERCY HOSPITAL
4077 Fifth Avenue, San Diego, CA 92103 - (619) 294-8111

PALOMAR MEDICAL CENTER
2185 Citracado Parkway, CA 92029 - (442) 281-5000

SCRIPPS MEMORIAL HOSPITAL, LA JOLLA
9888 Genesee Avenue, La Jolla, CA 92037 - (858) 457-4123

SHARP MEMORIAL HOSPITAL
7901 Frost Street, San Diego, CA 92123 - (858) 541-3400

UNIVERSITY OF CALIFORNIA, SAN DIEGO MEDICAL CENTER
200 West Arbor Drive, San Diego, CA 92103 - (619) 543-6222